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Schumacher, Anika; Goukens, Caroline ; Geyskens, Kelly

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# Surprise labels increase indulgent food portion size choice

Anika Schumacher<sup>a,\*</sup>, Caroline Goukens<sup>b,1</sup>, Kelly Geyskens<sup>b,1</sup>

<sup>a</sup> Department of Marketing, University of Groningen, The Netherlands

<sup>b</sup> Department of Marketing and Supply Chain Management, Maastricht University, The Netherlands

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## ABSTRACT

Food package labels can significantly influence food portion size choice. In this research we investigate whether package labels featuring the word ‘surprise’ influence food portion size choice of hedonic snacks. Surprise appeals are used frequently by the food industry to encourage product choice (e.g., surprise menus at restaurants), but their effect on portion size choice is not yet well understood. In four experimental studies, we investigate the effect of surprise labels—without changing the level of information about the product—on food portion size choice. We consistently find that surprise labels (e.g., surprise chocolates box)—compared to conventional labels (e.g., chocolates box)—increase food portion size choice. We furthermore show that this effect is driven by an increase in anticipated enjoyment associated with the surprise-labeled snack. Theoretically, our findings contribute to literature on the implications of the halo effect in food portion size choice by showing that a surprise label triggers a positive halo effect and thereby increases portion size choice.

## 1. Introduction

Nowadays, many food-marketing initiatives use ‘surprise’ labels as a way to make their offerings more attractive and encourage purchase behavior. Restaurants, for instance, use the label ‘surprise’ to title their menu (e.g., [London.danslenoir.com](http://London.danslenoir.com)), manufacturers refer to ‘surprise’ to describe a product (e.g., Goldilocks cake: “A creamy surprise in every slice”), and companies include the label ‘surprise’ in their slogans (e.g., Quaker’s cereal: “Life is full of surprises”). Yet, despite its prevalence in the marketplace, it remains unclear how adding surprise labels to hedonic food products affects consumers’ buying behavior. Especially in the light of the current obesity epidemic ([World Health Organization, 2018](http://WorldHealthOrganization.org)), research on the effects of surprise labels on consumers’ buying behavior and—in particular—portion size choice of hedonic food products is important and timely for consumer welfare.

Portion size choice refers to the amount of food consumers choose for consumption in one occasion ([Almiron-Roig, Navas-Carretero, Emery, & Martínez, 2018](#)). Prior research univocally acknowledges portion size choice as an important predictor of subsequent food intake ([Vandenbroele, Slabbinck, Van Kerckhove, & Vermeir, 2018](#); [Werle, Dubelaar, Zlatevska, & Holden, 2019](#); [Zlatevska, Dubelaar, & Holden, 2014](#)). While previous research has mainly looked into the effects of nutrition-related package cues on portion size choice (e.g., [McCann et al., 2013](#); [McCrickerd, Tang, & Forde, 2020](#)), we look at how

‘surprise’ labels impact portion size choice of hedonic food.

To investigate in what way surprise labels affect portion size choice, we designed a number of studies in which we merely manipulated the product label. That is, while one group of individuals was exposed to a hedonic food product featuring a conventional package label (e.g., chocolate box), another group was exposed to the same product featuring a surprise label (e.g., surprise chocolate box, study 2). The actual level of product information available to participants is thus similar for both groups.

From a rational decision-making perspective, the mere adding of a label to a product should not alter consumers’ perception of the product and thus should not alter decisions. Nevertheless, empirical evidence suggests two—at first sight opposite—ways in which surprise labels can affect portion size choice. On the one hand, a surprise signifies a schema-discrepant event ([Reisenzein, Horstmann, & Schützwohl, 2017](#)) and therefore seems to announce that the product will violate consumer expectations. Such violations of expectations—even if positive—are usually perceived as aversive because they violate individuals’ need for certainty and predictability ([Berlyne, 1957](#); [Heine, Proulx, & Vohs, 2006](#); [Mendes, Blascovich, Hunter, Lickel, & Jost, 2007](#); [Proulx & Inzlicht, 2012](#)). Within the food domain, prior research consistently finds that familiarity rather than unfamiliarity increases liking. As such, consumers have a strong preference for previously encountered food products ([Pliner, 1982](#)).

\* Corresponding author at: P.O. Box 800, 9700 AV Groningen, The Netherlands.

E-mail addresses: [a.schumacher@rug.nl](mailto:a.schumacher@rug.nl) (A. Schumacher), [c.goukens@maastrichtuniversity.nl](mailto:c.goukens@maastrichtuniversity.nl) (C. Goukens), [k.geyskens@maastrichtuniversity.nl](mailto:k.geyskens@maastrichtuniversity.nl) (K. Geyskens).

<sup>1</sup> P.O. Box 616, 6200 MD Maastricht, The Netherlands.

On the other hand, individuals tend to see surprise as something positive. We know from research using linguistic and retrospective methods that surprise has a positive connotation (Noordewier & Breugelmans, 2013). The word surprise is indeed typically used during happy life events (e.g., a surprise present, a surprise party). Thus, adding a surprise label might turn a positive experience into an even more pleasurable one. In one of their studies, for example, Noordewier and Breugelmans (2013) show that adding a surprise tag to an emotion face rendered individuals' evaluation of this face more positive. Furthermore, within a certain range, a touch of unexpectedness is well appreciated in life. According to the so-called "optimal level" theories, consumers strive for an optimal level of "arousal" being induced by slight deviations from the familiar (Berlyne, 1967; van Trijp & van Kleef, 2008). As such, the unexpectedness associated with gifts or lottery outcomes has been shown to intensify experienced pleasure (Mellers, Schwartz, Ho, & Ritov, 1997) and to prolong positive mood (Wilson, Centerbar, Kermer, & Gilbert, 2005). Also, within the food domain, unexpectedness can enhance a consumption experience (Mielby & Frøst, 2010; Sulmont-Rossé, Chabanet, Issanchou, & Köster, 2008).

We thus put forward that adding a surprise label to a familiar pleasurable food product may increase expected enjoyment associated with this product. This effect is akin to a so-called "halo effect". A halo effect implies that consumers' assessments of a product label can affect their subsequent impressions of other attributes of the product that it advertises, such as expected tastiness (Lee, Shimizu, Kniffin, & Wansink, 2013). Furthermore, as consumers typically choose more of hedonic foods that they like (Brunstrom & Shakeshaft, 2009), this increase in expected enjoyment will result in larger food portion size choices. Hence, based on this reasoning, we would predict that adding a surprise label to a conventional food package (e.g., "surprise chocolates box" rather than "chocolates box") may encourage consumers to choose larger food portions.

In the remainder of this manuscript, we report four studies in which we investigate how surprise labels affect portion size choice for hedonic food products. The studies show that adding surprise labels to a hedonic food item increases consumers' preferred food portion size. We thus find support for a halo effect: The positive connotation of surprise labels changes consumers' perception of the overall product. Specifically, it increases expected consumption enjoyment. The latter is explicitly tested in the fourth study.

## 2. Experimental studies

We designed a number of studies in which we vary the presence of a surprise label while keeping the level of other information and familiarity of the product constant across conditions. This allows us to parsimoniously test the effects of mere labelling of surprise. In what follows, we first describe the selection of hedonic products that were used in the experimental studies. Next, we present four experimental studies designed to examine the influence of surprise labels on portion size choice.

### 2.1. Choice of snack products

In all experimental studies we made use of 40 snacks, of which 20 snacks served as a content for packages that carried a surprise label (i.e., labels mentioning the word surprise or mystery) and of which 20 served as a content for the packages that carried a regular label. We selected everyday snacks that are unbranded but familiar and commonly available in the local supermarket. Snacks ranged from chocolate drops to salty chips. We ran a pretest ( $n = 90$ ) to ensure that the snacks in both conditions (surprise label and regular label) did not significantly differ with respect to general liking and desirability. After excluding 12 participants who reported potential allergies to the shown products, our results indicate that the snacks in the surprise label and in the regular

label conditions did not differ in overall liking ( $M_{\text{sur\_snacks}} = 3.17$ ,  $SD = 0.52$  vs.  $M_{\text{regular\_snacks}} = 3.15$ ,  $SD = 0.54$ ;  $t(77) = 0.51$ ,  $p > 0.5$ ) and desirability ( $M_{\text{sur\_snacks}} = 2.07$ ,  $SD = 0.70$  vs.  $M_{\text{regular\_snacks}} = 2.02$ ,  $SD = 0.67$ ;  $t(77) = 1.54$ ,  $p = 0.126$ ). We thus deemed the snacks appropriate for the remainder of the studies.

### 2.2. The impact of surprise labels on portion size choice

Studies 1a, 1b, and 1c served to establish evidence for the main effect of surprise labels on portion size choice. Across studies 1a–c, we made use of a within-subjects design, allowing us to account for potentially confounding individual difference factors. As the way in which the food portions are presented can influence choice behavior (Chandon & Ordabayeva, 2009, 2017; Cornil, Ordabayeva, Kaiser, Weber, & Chandon, 2014), we measured portion size choice using different portion sizes, different choice set sizes, and different portion size information formats (i.e., verbal versus visual).

### 2.3. Study 1a: Seven portion size options

#### 2.3.1. Participants and design

For study 1a, we recruited 58 participants (30 women,  $M_{\text{age}} = 18.93$ ,  $SD = 0.97$ ) of a public university who were randomly presented with 40 consecutive trials of snack boxes, of which 20 trials displayed surprise labels (i.e., labels mentioning the word surprise or mystery) and 20 trials displayed regular labels. Participants chose from seven different portions ranging from 0 g to 300 g in 50 g increments. The portion size was written in numeric format (in grams) below each picture (a sample display can be found in the [supplementary material](#)). The food items were not countable.

#### 2.3.2. Procedure and measures

In study 1a, participants were invited to our university lab. Upon arrival, we informed them to follow the instructions on the computer screen. As an introduction to our study, participants read that they would take part in a study on food consumption which involved making a series of choices for multiple snack products in terms of preferred portion size. Further, they were informed that they would receive one of their chosen portions for immediate consumption upon completion of the study. Every participant was thus exposed to all 40 snack products with their corresponding label (i.e., 'surprise' or 'regular') in randomized order. To select one of the presented portion sizes, participants had to press the corresponding number on their keyboard (i.e., for the portion size choice options of 0 g, 50 g, 100 g, or 150 g, 200, 250, 300, participants had to press the numbers 1, 2, 3, 4, 5, 6, or 7 respectively).

Each trial was composed of a label manipulation phase (4 s) during which participants saw the respective closed, non-transparent snack box with the respective label (surprise vs. regular; see [supplementary material](#) for a sample of the boxes used), followed by a short opening phase (2 s)—during which participants had to press the SPACE button to open the box—and a content display phase (4 s)—during which they saw a photograph of the content of their snack box. This picture included a small repetition photo of the box in the upper left corner (see [supplementary material](#) for an overview of all snack pictures used). Subsequently, in the portion size choice phase (4 s), participants were asked to select the respective snack portion they intended to consume (see [supplementary material](#) for samples of portion choice display). Upon choosing, participants received a short feedback about their choice: "you chose [their respective choice]" (2 s), followed by a fixation cross screen (2 s) that separated a trial from the next one.

The first part of the study (the label manipulation and dependent measure) was set up in E-Prime, a software that allowed us to exactly time the display of the label manipulation, the uncertainty resolution phase (equivalent to the content display phase of 4 s), and time available for each portion size choice. Furthermore, it allowed us to measure the time participants took to make a portion choice in the portion size

choice phase. After making their portion size choices, participants completed several additional measures: First, they completed all items of the restraint eating scale (Herman & Polivy, 1975;  $\alpha_{\text{Study 1A}} = 0.83$ ). We also asked participants to indicate their current level of hunger ("How hungry are you feeling at the moment?"; 1 = not at all; 7 = very hungry). Lastly, participants indicated their general liking, desirability, and perceived healthiness of each of the displayed snacks (1 = not at all; 5 = very much) and filled in demographics. We also asked them to report food allergies.

### 2.3.3. Results

Similar to previous research with a similar experimental design (e.g., Reimann, MacInnis, & Bechara, 2016), we analyzed the data using a random intercept model with portion size choice as dependent variable assuming equal spacing between the portions, label (coded 1 for surprise and 0 for regular labels) as independent variable, and subject ID as clustering variable. The dependent variable was left in its original metric, 50 g increments from 1 = 0 g to 7 = 300 g. We estimated the model using restricted maximum likelihood estimation.

In line with our hypothesis we find that participants on average chose larger portions for snacks that were received in a box carrying a surprise label compared to snacks that were received in a box carrying a regular label ( $b = 0.36$ ,  $SE = 0.06$ ,  $z = 5.83$ ,  $p < 0.001$ , 95% confidence interval [CI] [0.24, 0.48]). As men and women generally differ in their perception of uncertainty and may exhibit different levels of risk-taking behavior (Kovacheva, Nikolova, & Lamberton, 2017), we checked for potential confounding effects of gender. Furthermore, participants' portion size choice may have been influenced by specific dietary restrictions. We therefore included gender and restrained eating as covariates in our analysis. Including gender in the model as fixed effects variable yielded a significant main effect of gender ( $b = -1.32$ ,  $SE = 0.25$ ,  $z = -5.17$ ,  $p < 0.001$ , 95% CI [-1.81, -0.82]), but no significant interaction effect with label ( $b = -0.34$ ,  $SE = 0.12$ ,  $z = 0.27$ ,  $p = 0.787$ ). Restrained eating yielded no significant main nor interaction effects. Perceived healthiness, general liking, and desirability had a significant main effect on portion size choice, but we did not observe a significant interaction effect with label. Furthermore, the momentary level of hunger neither had a significant main effect nor a significant interaction effect with label on portion size choice. Lastly, we also did not find significant differences in the time participants took to make a portion choice from food products with a surprise label compared with food products without such label (see [supplementary material](#) for detailed analyses).

## 2.4. Study 1b: Four portion size options

### 2.4.1. Participants and design

For study 1b we recruited 53 participants (30 women,  $M_{\text{age}} = 19.04$ ,  $SD = 1.58$ ) from a public university. As in experiment 1a, participants were randomly presented with 40 consecutive trials of snack boxes, of which 20 trials displayed surprise labels and 20 trials displayed regular labels in a within-subjects design (see [supplementary material](#) for a sample of snack box pictures). However, in contrast to study 1a, we changed the number of portion size options from which participants could choose. Specifically, in this study, participants could choose from four portion sizes only, ranging from 40 g to 160 g in 40 g increments. Numeric portion size information (in grams) was written below each picture (see [supplementary material](#) for samples of portion choice display). As in study 1a, the food items in this study were not countable.

### 2.4.2. Procedure

The procedure in study 1b was identical to the procedure in study 1a with the only difference being the time for the portion size choice (3 s instead of 4 s) and the difference in the number of portion size options. First, participants were exposed to the label manipulation

phase (4 s) during which participants saw the respective closed, non-transparent snack box with the respective label (surprise vs. regular), followed by a short opening phase (2 s)—during which participants had to press the SPACE button to open the box—and a content display phase (4 s)—during which they saw a photograph of the content of their snack box (see [supplementary material](#) for an overview of all snack pictures used). Subsequently, in the portion size choice phase (3 s), participants were asked to select the respective snack portion they intended to consume. Participants then received a short feedback about their choice: "you chose [their respective choice]" (2 s), followed by a fixation cross screen (2 s) that separated a trial from the next one.

Subsequently, participants completed all items of the restraint eating scale (Herman & Polivy, 1975;  $\alpha_{\text{Study 1B}} = 0.76$ ), reported their current level of hunger ("How hungry are you feeling at the moment?"; 1 = not at all; 7 = very hungry), their general liking, desirability, and perceived healthiness of each of the displayed snacks (1 = not at all; 5 = very much). Lastly, they filled in demographics. We also asked them to report any food allergies.

### 2.4.3. Results

A random intercept regression model with portion size choice as dependent variable, label as independent variable, and subject ID as clustering variable yielded significant effects of label ( $b = 0.20$ ,  $SE = 0.04$ ,  $z = 5.08$ ,  $p < 0.001$ , 95% CI [0.12, 0.28]). Including gender and restraint eating as well as their respective interactions with label as covariates in the model did not yield any significant effects on portion size choice. As in study 1a, general liking, desirability, and perceived unhealthiness of the surprise box content had a significant main effect on portion size choice, but no significant interaction effect with label. Again, we did not observe significant differences in the time participants took to make a respective portion size choice (see [supplementary material](#) for detailed analyses).

## 2.5. Study 1c: Two portion size options

### 2.5.1. Participants and design

For this study, we invited 48 participants (23 women,  $M_{\text{age}} = 19.33$ ,  $SD = 1.75$ ) to our research lab at a public university. As in studies 1a and 1b, participants were randomly exposed to 40 consecutive trials of snack boxes, of which 20 trials displayed surprise labels and 20 trials displayed regular labels. However, in contrast to study 1a and 1b, participants in this study could only choose between two choice options: a small portion (50 g) or a large portion (150 g) that were visually different in size (see sample portion choice in [supplementary material](#)).

In this study no numeric portion size information was given. Like in studies 1a and 1b, the food items were not countable.

### 2.5.2. Procedure

The experimental setup was similar to the setups in study 1a and 1b. The only difference was that we adjusted the time for the portion size choice based on the number of portion size options available. In this study, participants had only two seconds to make their portion size choice from two available options in each trial. To select one of the respective portion sizes (50 g, 150 g), participants had to press the numbers 1 or 2 respectively. Upon completing all portion choice trials, participants completed all items of the restraint eating scale (Herman & Polivy, 1975;  $\alpha_{\text{Study 1C}} = 0.73$ ). We then asked participants to indicate their current level of hunger ("How hungry are you feeling at the moment?"; 1 = not at all; 7 = very hungry), their general liking, desirability, and perceived healthiness of each of the displayed snacks (1 = not at all; 5 = very much), similar to studies 1a and 1b. Finally, participants reported demographics and food allergies.

### 2.5.3. Results study 1c

A random intercept logistic regression model with portion size choice (small vs. large) as dependent measure, label as independent



variable, and subject ID as clustering variable, replicates the results observed in studies 1a and 1b, such that participants were significantly more likely to choose the larger portion in the surprise label condition than in the regular label condition ( $b = 0.53$ ,  $SE = 0.10$ ,  $z = 5.08$ ,  $p < 0.001$ , 95% CI [0.32, 0.73]). Including gender, perceived healthiness, and restrained eating—as well as their respective interactions with label—in the analysis did not yield any significant effects on portion size choice. As in studies 1a and 1b, liking and desirability had a significant main effect on portion size choice, but no significant interaction effect with label. Similar to studies 1a and 1b, we did not find a significant effect of label on the time participants took to make a portion choice (see [supplementary material](#) for detailed analyses).

## 2.6. Discussion studies 1a–c

Collectively, studies 1a–1c provide evidence that a surprise label increases portion size choice in repeated choice contexts. Importantly, we replicated the effect for different portion size choice options (multiple vs. two) and for portion size representations that were both numerically described and visually represented. Therefore, it is unlikely that our results occur due to mere visual biases in portion size estimation.

These findings support the idea that surprise has a positive connotation. When adding a surprise label to a familiar hedonic product, portion size choice increases. The positive linguistic nature of the word surprise thus seems to spill over to the overall product—similar to a so-called halo effect. Study 2 explicitly tests the impact of surprise labels on expected enjoyment of the actual product.

## 2.7. Study 2: the role of expected enjoyment

The above-described studies showed that consumers choose larger portions when a surprise label is added to a food product. In this study we seek to find empirical support for a halo effect as the process underlying our findings in studies 1a–1c. Specifically, we expect that the positive connotation of the label ‘surprise’ changes consumers’ overall perception of the labeled product such that it increases expected enjoyment. In study 2, we explicitly measure product expectations, and test in how far anticipated enjoyment mediates the effect of label on portion size choice.

### 2.7.1. Participants and design

Fifty-two participants (22 females, 2 failed to report gender;  $M_{age} = 22.58$ ,  $SD = 6.08$ ) from a public university participated in our study in return for course credit. Sample size was determined arbitrarily based on the size of the participation pool. Label was manipulated between-subjects in this study and participants were asked to make 20 consecutive portion size choices from foods with a surprise label (surprise label condition) or foods without such label (regular label condition).

### 2.7.2. Procedure and measures

Participants were invited to our university lab and randomly assigned to either the surprise label or the regular label condition. They completed the study in individual cubicles. Upon arrival, we asked participants to follow the instructions on the computer screen. The first part of the study (the label manipulation and portion size choice dependent measure) was set up in E-Prime. As in studies 1a–c, participants read that they would take part in a study on food consumption which involved multiple snack products of which they could choose the respective portion they would like to consume. Further, they were informed that they would receive one of their chosen portions for immediate consumption upon completion of the study. To select one of four respective portion sizes (40 g, 80 g, 120 g, or 160 g), participants had to press the numbers 1, 2, 3, or 4 respectively (see [supplementary material](#) for samples of portion choice display). In total, they were

exposed to 20 consecutive trials, 20 trials with surprise labels in the surprise label condition and 20 trials with regular labels in the regular label condition. Each trial was composed of a label manipulation phase (4 s), followed by a content display phase (4 s) and a portion size choice phase (3 s)—as in the previous studies. Upon choosing participants received short feedback about their choice (2 s), followed by a fixation cross screen (2 s) that separated one trial from the next one. As in studies 1a–c, the exact timing of each phase allowed us to measure the time (in ms) participants took to make a choice. After making their portion size choices, we measured our focal measure of interest: anticipated enjoyment of the snacks. Specifically, participants indicated their expected enjoyment of consuming each of the displayed snacks on a 5-point scale (1 = enjoy not at all; 5 = enjoy very much). They then completed the restrained eating scale (Herman & Polivy, 1975;  $\alpha = .60$ ) and demographics. Finally, participants reported if they had any allergies that influenced their food choices.

### 2.7.3. Results and discussion

**Portion size choice.** For the analysis, we excluded two participants who reported allergies that influenced their portion choices, leaving 50 participants for analysis. To test our main hypothesis, we computed the average portion size choice across trials in each condition. For this analysis, we first calculated the mean portion size choice across all 20 trials for each participant and then conducted an independent samples *t*-test comparing the mean portion size choices of participants in the surprise label condition and the regular label condition respectively. Our analyses yield a significant difference in mean portion size choice such that participants who received boxes carrying a surprise label chose significantly larger portions on average ( $M_{surprise} = 2.46$ ,  $SD = 0.65$ ) than participants who received boxes with a regular label ( $M_{regular} = 2.0$ ,  $SD = 0.33$ ;  $t(42) = 2.82$ ,  $p = 0.009$ ,  $d = 0.83$ , 95% CI [0.12, 0.74]). A Cohen’s *d* of 0.83 implies a large effect size (Cohen, 1988).

Analyzing the data using a 2 (label: surprise vs. regular, between-subjects)  $\times$  20 (iterations, within-subjects) mixed ANOVA with portion size choice as the dependent variable (treated as interval scale, assuming equal spacing between portion sizes; see also Cornil & Chandon, 2016; Hagen, Krishna, & McFerran, 2016) did reveal similar results. We only observed a significant main effect of label ( $F(1,48) = 2.25$ ,  $p = 0.004$ ). The test of within-subjects effects—that is choice variations across trials—did not yield a significant main effect of trial ( $F(19, 912) < 1$ ,  $p = 0.682$ ), nor a significant interaction with label ( $F(19, 912) = 1.31$ ,  $p = 0.165$ ), speaking against a general increasing or decreasing trend in portion size choice over the consecutive trials for the surprise label or regular label condition respectively. This also renders it unlikely that our observations are due to satiation or desire effects associated with repeated exposure to food images over the consecutive trials (Hetherington, Pirie, & Nabb, 2002).

**Expected enjoyment.** We calculated the average expected enjoyment of consuming the snacks that participants saw in the respective conditions. As hypothesized, a mediation analysis with portion size choice (averaged) as dependent variable, label as independent variable, and expected enjoyment as mediator, suggests that expected enjoyment drives portion size choice. Specifically, a mediation analysis with Hayes Process Macro (Hayes, 2013) Model 4 using 10,000 bootstrapping samples and bias-corrected confidence intervals showed a significant indirect effect of expected enjoyment ( $b = 0.19$ ,  $SE = 0.01$ , 95% CI [0.05 0.44]).

Including gender and restrained eating as covariates in the analysis did not yield any significant main nor interaction effects with label on portion size choice. Furthermore, we also did not find significant differences in time participants took to make a portion choice between the surprise label condition and the regular label condition (see [supplementary material](#) for analyses).

The results of the present study provide additional evidence that a surprise label increases food portion size choice. In addition, this study

revealed that anticipated enjoyment mediates the effect of label on portion size choice. This confirms our theorizing that a surprise label increases anticipated liking and consequently increases portion size choice.

### 3. Discussion

Surprise labels are used frequently in food marketing—be it in form of surprise menus, product labels, or slogans. Yet, relatively little is known on how such labels influence food portion size choice. Although previous research has investigated the effect of unfamiliar (Sulmont-Rossé et al., 2008) and surprising elements (Mielby & Frøst, 2010) on consumption, our study is the first to particularly consider the effect of surprise labels. In four studies we demonstrate the general idea that surprise labels—compared to regular product labels—increase food portion size choice. Furthermore, we show that consumers' favorable consumption expectations mediate the effect of surprise labels on portion size choice (study 2). Our studies reveal a consistent and large effect of surprise labels on portion size choice in a within-subjects as well as between-subjects experimental design.

This research makes several important contributions. Theoretically, we intend to increase understanding on how package labels influence food portion size choice. Many studies have demonstrated that product labels can trigger a halo effect and thereby influence food perceptions and choice (Lee et al., 2013; Rousseau, 2015; Skaczkowski, Durkin, Kashima, & Wakefield, 2016; Sörqvist et al., 2015). However, this stream of research has mostly focused on health-related, organic, and eco-friendly product labels. In contrast, this research investigates the effect of the label 'surprise' which initially offers opposing theoretical predictions. On the one hand, a surprise label could be perceived negatively as it reduces predictability and violates meaning (Heine et al., 2006; Proulx & Inzlicht, 2012). On the other hand, lay beliefs point to the positive connotation of surprises (Noordewier & Breugelmans, 2013). Furthermore, unfamiliarity may be perceived positively in some cases (Mielby & Frøst, 2010; Sulmont-Rossé et al., 2008). In line with this latter research stream we show that surprise labels create a halo effect that increases anticipated product enjoyment and thereby leads to larger hedonic food portion choices.

Besides offering interesting theoretical insights, this research also has its limitations.

One limitation of our studies is that we merely investigate the effect of surprise labels on product choice and—specifically—the amount chosen for intended consumption. Yet more favorable expectations about consumption and thus, consumption intentions, may not necessarily translate into a more pleasant actual consumption experience. Future research should thus look into how the effect of surprise labels unfolds during the consumption experience and possibly investigate the effect of other labels that reduce predictability, such as “sneak” (e.g., sneak preview).

Second, we reckon that while an increased anticipation of enjoyment may explain our observed portion choice effect, other factors could also contribute to this desire. One salient factor may be greater involvement. Indeed, previous research has shown that lower attitude certainty can increase involvement (Lee, 2000) and trigger deeper information processing (Tiedens & Linton, 2001; Tormala & Rucker, 2007). While we do not have self-report measures to rule out this possibility, our studies do not reveal significant differences in reaction time between portion size choices from surprise boxes and portion size choices from regular boxes without such label (see [supplementary material](#)). A more deliberate decision-making process involving deeper processing of information has been shown to require more time than a fast, heuristic form of decision-making (Haugtvedt, Kardes, & Herr, 2008). Thus, insignificant differences in choice response time provide some evidence against deeper information processing in the surprise label condition.

Third, we only used hedonic sweet and salty snack foods in our

studies. Investigating whether the effect also holds for healthy foods is a fruitful avenue for future research.

Fourth, our research uses relatively small sample sizes. Although these sample sizes may be sufficient for a within-subjects design (see Greenwald, 1976; Keren, 2014 for a discussion on sample size and statistical power in within-subjects designs), it is important to generalize these findings in a large-scale field study.

Our research also provides important practical insights. Our results reveal that surprise can increase portion size choice due to consumers' favorable consumption expectations which are induced by merely changing a product label. The use of surprise labels represents a relatively simple, easy-to-implement, and cost-efficient way for companies to increase food portion size choice. To that end, our insights are particularly relevant for food-distributing companies whose business model is built on the idea that surprise boxes serve as consumption trials that should encourage subsequent product purchase online. They also offer important insights for restaurants which oftentimes use daily specials and label these as either “surprise menu” or “chef's menu”. Our results reveal that labelling a daily special as a “surprise” may increase the number of courses a consumer chooses to order for intended consumption.

At the same time, our findings reveal that—from a public health perspective—surprise labels may backfire as they seem to encourage indulgence. To the extent that portion size choices do determine actual consumption (Zlatevska et al., 2014), surprise labels may encourage unhealthy snacking behavior, which—if pursued excessively—can have negative long-term health consequences such as overweight and diabetes (WHO, 2018).

In conclusion, this research provides first evidence for the unique halo effects of surprise labels on portion size choice. It also highlights that subtle and easy-to-implement tactics such as labelling can change consumers' perceptions of a product and—relatedly—its anticipated consumption enjoyment and choice.

### Credit authorship contribution statement

**Anika Schumacher:** Conceptualization, Methodology, Writing - original draft. **Caroline Goukens:** Funding acquisition, Writing - review & editing, Supervision. **Kelly Geyskens:** Writing - review & editing, Supervision.

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### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.foodqual.2020.103919>.

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